UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/268,999	03/16/99	ARITA	1075.1112/JD

EXAMINER	
THANGAVELU, K	

ART UNIT	PAPER NUMBER
2123	

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TM21/1102

DATE MAILED: 11/02/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary	Application N .	Applicant(s)	
	09/268,999	ARITA, YUICHI	
	Examiner	Art Unit	
	Kandasamy Thangavelu	2123	

-- The MAILING DATE of this communication appears on the c ver sheet with the correspondence address --

Peri d for R ply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 May 1999* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6 and 13-23* is/are rejected.

7)☒ Claim(s) *5 and 7-12* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Pri rity under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Introduction

1. Claims 1 to 23 of the Application 09/268999 filed on 16 March 1999 are pending.

Foreign Priority

2. Acknowledgment is made of applicant's claim for foreign priority based on an application 10-3089632 filed in Japan on March 20, 1998. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file. The papers have not been perfected.

Information Disclosure Statement

3. Acknowledgment is made of the information disclosure statements filed on March 16, 1999 together with the abstracts of the relevant patents in English. The abstracts have been considered in reviewing the claims.

Specification

4. The disclosure is objected to because of the following informalities:

Page 11 Line 7 "or in the source of designing" is incorrect.

Page 11 Line 10 "leakage of interference checking" is incorrect.

Page 11, Line 25 "in which like parts or elements denoted by" is grammatically incorrect.

Page 15, Line 24 "The simulation apparatus 1 may other be constructed" is grammatically incorrect.

Page 15, Line 26 "section 3 stores information of one ore more tool models" is incorrect.

Page 23 Line 13 "or in the source of designing" is incorrect.

Page 26, line 22 "a worker works directly with its hand" is grammatically incorrect.

Page 30, Line 15 refers to model 32A of a hexagon wrench while Line 5 refers to model 32A of a screwdriver. These two references are inconsistent.

Appropriate corrections are required.

Claim Objections

5. The following is a quotation of 37 C.F.R § 1.75 (d)(1):

> The claim or claims must conform to the invention as set forth in the remainder of the specification and terms and phrases in the claims must find clear support or antecedent basis in the description so that the meaning of the terms in the claims may be ascertainable by reference to the description.

6. Claim 5 is objected to because of the following informalities.

Page 82 Lines 9 "simulation of working for standard part models" is grammatically incorrect.

Appropriate correction is required.

7. Claim 7 is objected to as being dependent upon a rejected dependent claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. Claim 8 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. Claim 9 is objected to as being dependent upon a rejected dependent claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

10. Claim 10 is objected to as being dependent upon a rejected dependent claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. Claim 11 is objected to as being dependent upon a rejected dependent claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

12. Claim 12 is objected to as being dependent upon a rejected baset claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Prior Art

13. **Nozaki (NZ)** (US Patent 6,167,142) teaches Object Movement simulation apparatus. NZ teaches the following:

1. The object movement **simulation apparatus** in which works such as **assembling of parts or components** are implemented by a simulation (Col 1, Lines 7-10).
2. **Three-dimensional CAD system** is used for a product design (Col 1, Lines 14-15).

3. The simulation apparatus is capable of performing a simulation as to whether a **designed product** can be actually **assembled or disassembled without any collision** with other parts (Col 1, Lines 33-37).
4. To inspect as to whether **assembling is possible** through the simulation, a technology of searching a disassembling route for **no occurrence of collision** is used with a three dimensional CAD system (Col 1, Lines 40-46).
5. The simulation apparatus helps to know the closest point between an **object (part)** on **translation** and another object (Col 1, Lines 66-67).
6. Perform the translation (**assembling, disassembling** etc) **simulation** (Col 2, Lines 5-6).
7. **Object of interest** of **translation simulation** and **objects** existing **around** the object of interest are disposed in a **virtual three-dimensional space** (Col 2, Lines 10-12).
8. An object movement **simulation apparatus** capable of **displaying a three-dimensional image** in which a **closet point** and a collision point are easy to see and a **position relation among objects** can be easily grasped (Col 3, Lines 23-26).
9. The **collision arithmetic means** performs arithmetic including a detection of **two closest points** in accordance with object **information of a plurality of objects** (Col 3, Lines 36-39).
10. In the **object movement simulation** apparatus, the image producing means produces **three-dimensional images** for a **plurality of objects** after movement (Col 3, Lines 64-67).
11. Collision arithmetic performs arithmetic among an object of interest and other objects; the arithmetic includes a **detection of occurrence of collision** (Col 5, Lines 22-26).
12. A **program for** implementing the **object translation simulation** apparatus. The program is **stored in the storage unit** (Col 8, Lines 16-19).
13. An object disposed in a virtual three-dimensional space constructed in a **computer system** is translated in accordance with **instruction information stored in the storage** (Col 8, Lines 22-29).
14. Translation implies a **movement** (in the narrow sense) **of a position** of an object; movement is in the broad sense a concept including **a rotation of an object** (Col 8, Lines 54-57).
15. It is determined as to whether the instruction now read is concerned with **termination of the movement of the objects**, and if so, the **routine is terminated** (Col 9, Lines 14-19).
16. It is determined as to whether the instruction now read is concerned with **movement of the objects**, and if so, the **position of the object of interest is calculated** (Col 9, Lines 26-28).
17. A **collision processing** between the object of interest and another object is performed (Col 9, Lines 29-31).

18. There is produced a three-dimensional image after movement of the object and the **thr e-dimensional imag is displayed on the display unit** (Col 9, Line 67 to Col 10, Line 3).
19. The object movement simulation apparatus is implemented by **a computer system.** The computer comprises a CPU, a magnetic disk, an image display unit, a keyboard, a mouse and a **3D plotting unit** etc (Col 7, Lines 43-60).

Claim Rejections - 35 USC § 102

14. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

15. Claim 1 is rejected under 35 U.S.C. 102(e) as being clearly anticipated by **Nozaki (NZ)** (U.S. Patent 6,167,142).

Claim 1 specifies:

1. A simulation apparatus for simulating working of standard part models.
2. A design model designed in a virtual three-dimensional space.
3. One or more standard part models are arranged in the design model.
4. A working means model information storage section for storing information.
5. A working means model information extraction section.
6. A working simulation execution section for executing a simulation of the working for the standard part models with the working means model.

As per Claim 1, **NZ** recites a simulation apparatus for simulating working of standard part models. **NZ** says, "The object movement **simulation apparatus** in which works such as **assembling of parts or components** are implemented by a simulation" (Col 1, Lines 7-10).

NZ teaches a design model designed in a virtual three-dimensional space. **NZ** says, **"Object of interest** of **translation simulation** and **objects** existing **around** the object of interest are disposed in a **virtual three-dimensional space"** (Col 2, Lines 10-12).

NZ teaches one or more standard part models are arranged in the design model. **NZ** says, "The object movement **simulation apparatus** in which works such as **assembling of parts or components** are implemented by a simulation" (Col 1, Lines 7-10).

NZ teaches a working means model information storage section for storing information. **NZ** says, "The **collision arithmetic means** performs arithmetic including a detection of **two closest points** in accordance with object **information of a plurality of objects"** (Col 3, Lines 36-39).

NZ teaches a working simulation execution section for executing a simulation of the working for the standard part models with the working means model. **NZ** says, "The simulation apparatus is capable of performing a simulation as to whether a **designed product** can be actually **assembled or disassembled without any collision** with other parts" (Col 1, Lines 33-37).

NZ does not teach a working means model information extraction section. However, it is inherent that all simulation models have model information extraction sections just as they have model information storage section.

16. Claim 2 is rejected under 35 U.S.C. 102(e) as being clearly anticipated by **NZ.**

Claim 2 includes the apparatus of Claim 1 and further specifies:

1. The information regarding the standard part models includes attribute information of the working means model related to the standard part models.

NZ also teaches that the information regarding the standard part models includes attribute information of the working means model related to the standard part models. **NZ** says, "The **collision arithmetic means** performs arithmetic including a detection of **two closest points** in accordance with object **information of a plurality of objects**" (Col 3, Lines 36-39).

17. Claim 3 is rejected under 35 U.S.C. 102(e) as being clearly anticipated by **NZ.**

Claim 3 includes the apparatus of Claim 1 and further specifies:

1. Working means model information storage section stores information of tool models and/or a hand model.

NZ teaches that working means model information storage section stores information of tool models and/or a hand model. **NZ** says, "The **collision arithmetic means** performs arithmetic including a detection of **two closest points** in accordance with object **information of a plurality of objects**" (Col 3, Lines 36-39).

18. Claim 4 is rejected under 35 U.S.C. 102(e) as being clearly anticipated by **NZ.**

Claim 4 includes the apparatus of Claim 1 and further specifies:

1. The information regarding the working means model includes reference position information of the working means model.
2. The design information of the design model includes reference position information of the standard part models.
3. Working simulation execution section performs simulation of a relationship in position/posture of the working means model to the standard part models based on the reference position information.

NZ teaches that the information regarding the working means model includes reference position information of the working means model. **NZ** says, "An object movement **simulation apparatus** capable of **displaying a three-dimensional image** in which a **closet point** and a

collision point are easy to see and a **position relation among objects** can be easily grasped" (Col 3, Lines 23-26).

NZ teaches that the design information of the design model includes reference position information of the standard part models. **NZ** says, "An object movement **simulation apparatus** capable of **displaying a three-dimensional image** in which a **closet point** and a collision point are easy to see and a **position relation among objects** can be easily grasped" (Col 3, Lines 23-26).

NZ teaches that the working simulation execution section performs simulation of a relationship in position/posture of the working means model to the standard part models based on the reference position information. **NZ** says, "Translation implies a **movement** (in the narrow sense) **of a position** of an object; movement is in the broad sense a concept including **a rotation of an object"** (Col 8, Lines 54-57).

19. Claim 5 is rejected under 35 U.S.C. 102(e) as being clearly anticipated by **NZ.**

Claim 5 includes the apparatus of Claim 1 and further specifies:

> 1. Simulation apparatus further comprising an interference checking section for checking interference during simulation of the working of the standard part models with the working means model.

NZ teaches simulation apparatus further comprising an interference checking section for checking interference during simulation of the working of the standard part models with the working means model. **NZ** says, "Collision arithmetic performs arithmetic among an object of interest and other objects; the arithmetic includes a **detection of occurrence of collision"** (Col 5, Lines 22-26). It is understood that interference checking and collision checking mean the same.

20. Claim 6 is rejected under 35 U.S.C. 102(e) as being clearly anticipated by **NZ.**

Claim 6 includes the apparatus of Claim 5 and further specifies:

1. Interference checking section checks interference of the working means model including a route along which the working means model arrives at the standard part models.

NZ teaches that interference checking section checks interference of the working means model including a route along which the working means model arrives at the standard part models. **NZ** says, "To inspect as to whether **assembling is possible** through the simulation, a technology of searching a disassembling route for **no occurrence of collision** is used with a three dimensional CAD system" (Col 1, Lines 40-46).

21. Claim 13 is rejected under 35 U.S.C. 102(e) as being clearly anticipated by **Nozaki (NZ)** (U.S. Patent 6,167,142).

Claim 13 specifies:

1. A simulation method for simulating workability.
2. A design model displayed in a virtual three-dimensional space and designed.
3. One or more standard part models are arranged in the design model.
4. The steps of relating a working means model to one or more standard part models.
5. The steps of acquiring the working means model related to the standard part models.
6. The steps of executing a simulation of working to be performed for the standard part models using the working means model.
7. The steps of displaying a process of the execution of the simulation in a virtual three-dimensional space.

NZ teaches a simulation method for simulating workability. **NZ** says, "The simulation apparatus is capable of performing a simulation as to whether a **designed product** can be

actually **assembled or disassembled without any collision** with other parts" (Col 1, Lines 33-37).

NZ also teaches a design model displayed in a virtual three-dimensional space and designed. **NZ** says, **"Object of interest** of **translation simulation** and **objects** existing **around** the object of interest are disposed in a **virtual three-dimensional space"** (Col 2, Lines 10-12).

NZ also teaches one or more standard part models are arranged in the design model. **NZ** says, **"Object of interest** of **translation simulation** and **objects** existing **around** the object of interest are disposed in a **virtual three-dimensional space"** (Col 2, Lines 10-12).

NZ also teaches the steps of relating a working means model to one or more standard part models. **NZ** says, **"Object of interest** of **translation simulation** and **objects** existing **around** the object of interest are disposed in a **virtual three-dimensional space"** (Col 2, Lines 10-12).

NZ also teaches the steps of acquiring the working means model related to the standard part models. **NZ** says, "The **collision arithmetic means** performs arithmetic including a detection of **two closest points** in accordance with object **information of a plurality of objects"** (Col 3, Lines 36-39).

NZ also teaches the steps of executing a simulation of working to be performed for the standard part models using the working means model. **NZ** says, "The simulation apparatus is capable of performing a simulation as to whether a **designed product** can be actually **assembled or disassembled without any collision** with other parts" (Col 1, Lines 33-37).

NZ also teaches the steps of displaying a process of the execution of the simulation in a virtual three-dimensional space. **NZ** says, "An object movement **simulation apparatus** capable

of **displaying a three-dimensional image** in which a **closet point** and a collision point are easy to see and a **position relation among objects** can be easily grasped" (Col 3, Lines 23-26).

22. Claim 14 is rejected under 35 U.S.C. 102(e) as being clearly anticipated by **NZ.** Claim 14 includes the method of Claim 13 and further specifies:

1. A simulation method wherein a simulation of at least one kind of working from among assembling working, disassembling working, adjustment working and maintenance working for the standard part models is performed.

NZ also teaches a simulation method wherein a simulation of at least one kind of working from among assembling working, disassembling working, adjustment working and maintenance working for the standard part models is performed. **NZ** says, "The simulation apparatus is capable of performing a simulation as to whether a **designed product** can be actually **assembled or disassembled without any collision** with other parts" (Col 1, Lines 33-37).

23. Claim 15 is rejected under 35 U.S.C. 102(e) as being clearly anticipated by **NZ.** Claim 15 includes the method of Claim 13 and further specifies:

1. A simulation method wherein, where a tool is used to work the standard part models, the tool and a hand of a worker who uses the tool are used as the working means model to perform the simulation.

NZ also teaches a simulation method wherein, where a tool is used to work the standard part models, the tool and a hand of a worker who uses the tool are used as the working means model to perform the simulation. **NZ** says, "In the **object movement simulation** apparatus,

the image producing means produces **three-dimensional images** for a **plurality of objects** after movement" (Col 3, Lines 64-67).

24. Claim 16 is rejected under 35 U.S.C. 102(e) as being clearly anticipated by **NZ.**

Claim 16 includes the method of Claim 13 and further specifies:

1. A simulation method wherein, where the standard part models are to be worked by a hand of a worker itself, the hand of the worker is used as the working means model to perform the simulation of the working.

NZ also teaches a simulation method wherein, where the standard part models are to be worked by a hand of a worker itself, the hand of the worker is used as the working means model to perform the simulation of the working. **NZ** says, "In the **object movement simulation** apparatus, the image producing means produces **three-dimensional images** for a **plurality of objects** after movement" (Col 3, Lines 64-67).

25. Claim 17 is rejected under 35 U.S.C. 102(e) as being clearly anticipated by **NZ.**

Claim 17 includes the method of Claim 15 and further specifies:

1. A simulation method wherein, when the process of execution of the simulation of the working is displayed in the virtual three-dimensional space, the working means model is displayed in a shape suitable for an object of use in the virtual three-dimensional space.

NZ teaches a simulation method wherein, when the process of execution of the simulation of the working is displayed in the virtual three-dimensional space, the working means model is displayed in a shape suitable for an object of use in the virtual three-dimensional space. **NZ** says, **"Object of interest** of **translation simulation** and **objects** existing **around** the object of interest are disposed in a **virtual three-dimensional space"** (Col 2, Lines 10-12).

26. Claim 18 is rejected under 35 U.S.C. 102(e) as being clearly anticipated by **NZ.**

Claim 18 includes the method of Claim 16 and further specifies:

1. A simulation method wherein, when the process of execution of the simulation of the working is displayed in the virtual three-dimensional space, the working means model is displayed in a shape suitable for an object of use in the virtual three-dimensional space.

NZ teaches a simulation method wherein, when the process of execution of the simulation of the working is displayed in the virtual three-dimensional space, the working means model is displayed in a shape suitable for an object of use in the virtual three-dimensional space. **NZ** says, **"Object of interest** of **translation simulation** and **objects** existing **around** the object of interest are disposed in a **virtual three-dimensional space"** (Col 2, Lines 10-12).

27. Claim 19 is rejected under 35 U.S.C. 102(e) as being clearly anticipated by **NZ.**

Claim 19 includes the method of Claim 13 and further specifies:

1. A simulation method wherein a process through which the working means model arrives at one of the standard part models and a manner of working performed based on a condition defined for the working means model are displayed as the process of execution of the simulation.

NZ also teaches a simulation method wherein a process through which the working means model arrives at one of the standard part models and a manner of working performed based on a condition defined for the working means model are displayed as the process of execution of the simulation. **NZ** says, "An object disposed in a virtual three-dimensional space constructed in a **computer system** is translated in accordance with **instruction information stored in the storage"** (Col 8, Lines 22-29). **NZ** says, "There is produced a three-dimensional

image after movement of the object and the **three-dimensional image is displayed on the display unit"** (Col 9, Line 67 to Col 10, Line 3).

28. Claim 20 is rejected under 35 U.S.C. 102(e) as being clearly anticipated by **NZ.**

Claim 20 includes the method of Claim 19 and further specifies:

1. A simulation method wherein, after the working performed based on the condition defined for the working means model is completed, a process through which the working means model is spaced away from the subject position based on a condition defined in advance is displayed.
2. After the working means model is spaced by a predefined distance away from the subject position, the display of the working means model is erased.

NZ also teaches a simulation method wherein, after the working performed based on the condition defined for the working means model is completed, a process through which the working means model is spaced away from the subject position based on a condition defined in advance is displayed. **NZ** says, "It is determined as to whether the instruction now read is concerned with **movement of the objects**, and if so, the **position of the object of interest is calculated"** (Col 9, Lines 26-28). **NZ** says, "There is produced a three-dimensional image after movement of the object and the **three-dimensional image is displayed on the display unit"** (Col 9, Line 67 to Col 10, Line 3).

NZ also teaches that after the working means model is spaced by a predefined distance away from the subject position, the display of the working means model is erased. **NZ** says, "It is determined as to whether the instruction now read is concerned with **termination of the movement of the objects**, and if so, the **routine is terminated"** (Col 9, Lines 14-19).

29. Claim 21 is rejected under 35 U.S.C. 102(e) as being clearly anticipated by **NZ.**

Claim 20 includes the method of Claim 13 and further specifies:

1. A simulation method wherein, when interference occurs with the working means model in a process of execution of the working to be performed for the standard part models with the working means model, an occurrence condition of the interference is displayed.

NZ also teaches a simulation method wherein, when interference occurs with the working means model in a process of execution of the working to be performed for the standard part models with the working means model, an occurrence condition of the interference is displayed. **NZ** says, "Collision arithmetic performs arithmetic among an object of interest and other objects; the arithmetic includes a **detection of occurrence of collision"** (Col 5, Lines 22-26). **NZ** also says, "There is produced a three-dimensional image after movement of the object and the **three-dimensional image is displayed on the display unit"** (Col 9, Line 67 to Col 10, Line 3).

30. Claim 22 is rejected under 35 U.S.C. 102(e) as being clearly anticipated by **Nozaki (NZ)** (U.S. Patent 6,167,142).

Claim 22 specifies:

1. A computer-readable recording medium having a simulation program recorded thereon.
2. The program causes a computer to execute in a virtual three-dimensional space a simulation of working with a working means model.
3. The computer implements a function of acquiring information regarding a working means model related to one or more standard part models.
4. The computer implements a function of executing a simulation of working to be performed for the standard part models.
5. The computer implements a function of displaying a process of the execution of the simulation in a virtual three-dimensional space.

As per Claim 22, **NZ** recites a computer-readable recording medium having a simulation program recorded thereon. **NZ** says, "A **program for** implementing the **object translation simulation** apparatus. The program is **stored in the storage unit"** (Col 8, Lines 16-19).

NZ teaches that the program causes a computer to execute in a virtual three-dimensional space a simulation of working with a working means model. **NZ** says, "The simulation apparatus is capable of performing a simulation as to whether a **designed product** can be actually **assembled or disassembled without any collision** with other parts" (Col 1, Lines 33-37).

NZ teaches that the computer implements a function of acquiring information regarding a working means model related to one or more standard part models. **NZ** says, "The **collision arithmetic means** performs arithmetic including a detection of **two closest points** in accordance with object **information of a plurality of objects"** (Col 3, Lines 36-39).

NZ teaches that the computer implements a function of executing a simulation of working to be performed for the standard part models. **NZ** says, "The simulation apparatus is capable of performing a simulation as to whether a **designed product** can be actually **assembled or disassembled without any collision** with other parts" (Col 1, Lines 33-37).

NZ teaches that the computer implements a function of displaying a process of the execution of the simulation in a virtual three-dimensional space. **NZ** says, "There is produced a three-dimensional image after movement of the object and the **three-dimensional image is displayed on the display unit"** (Col 9, Line 67 to Col 10, Line 3).

31. Claim 23 is rejected under 35 U.S.C. 102(e) as being clearly anticipated by **Nozaki (NZ)** (U.S. Patent 6,167,142).

Claim 23 specifies:

1. A designing supporting apparatus, comprising a standard part model information storage section for storing information regarding one or more standard part models.
2. A designing supporting apparatus, comprising a designing supporting section for arranging one or more standard part models to perform supporting for designing a subject in a virtual three-dimensional space.
3. The designing supporting means includes an attribute information extraction section to extract attribute information of a working means model.
4. A design data outputting section for outputting data regarding the subject designed and data regarding the attribute information extracted by attribute information extraction section.

As per Claim 23, **NZ** recites a designing supporting apparatus, comprising a standard part model information storage section for storing information regarding one or more standard part models. **NZ** says, "The **collision arithmetic means** performs arithmetic including a detection of **two closest points** in accordance with object **information of a plurality of objects**" (Col 3, Lines 36-39).

NZ teaches a designing supporting apparatus, comprising a designing supporting section for arranging one or more standard part models to perform supporting for designing a subject in a virtual three-dimensional space. **NZ** says, "**Object of interest** of **translation simulation** and **objects** existing **around** the object of interest are disposed in a **virtual three-dimensional space**" (Col 2, Lines 10-12).

NZ teaches that the designing supporting means includes an attribute information extraction section to extract attribute information of a working means model. **NZ** says, "The **collision arithmetic means** performs arithmetic including a detection of **two closest points** in accordance with object **information of a plurality of objects**" (Col 3, Lines 36-39).

NZ does not teach a design data outputting section for outputting data regarding the subject designed and data regarding the attribute information extracted by attribute information extraction section. However, all design supporting simulation apparatus have inherent design data outputting sections for storing and printing the data regarding the subject designed and data regarding the attribute information extracted.

Conclusion

32. The prior art made of record and not relied upon is considered pertinent to the applicant's disclosure.

The following patents and papers are cited to further show the state of the art with respect to use of three-dimensional CAD simulations for design of objects involving numerous parts and to study collisions during assembly and disassembly.

1. Hirata et al., U.S. Patent 6,157,902, "Disassembly route producing apparatus, assembly route producing apparatus and supporting system for mechanical system design", December 2000.
2. Megahed et al., U.S. Patent 5,497,453, "Method and apparatus for detecting and visualizing interferences between solids", March 1996.
3. Sato, A et al., "A virtual object manipulation interface for automated assembly programming", 1994 International conference on System, Man and Cybernetics, October 1994.

33. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kandasamy Thangavelu whose telephone number is 703-305-0043. The examiner can normally be reached on Monday through Friday from 7:00 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kevin Teska, can be reached on (703) 305-9704. The fax phone number for the organization where this application or proceeding is assigned is 703-746-7329.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-9600.

K. Thangavelu
Art Unit 2123
October 26, 2001

KEVIN J. TESKA
SUPERVISORY
PATENT EXAMINER